Downregulation of RhoGDIα increased migration and invasion of ER+ MCF7 and ER− MDA-MB-231 breast cancer cells.

ABSTRACT

Rho GDp dissociation inhibitors (RhoGDIs) can inhibit cell motility, invasion, and metastasis in cancer by inactivating the RhoGTpases. A member of RhoGDI family has been consistently shown to interact with estrogen receptor (eR), and change its transcriptional activity. eR is a receptor known to be inversely correlated with cell motility and invasion in breast cancer. The consequence of RhoGDIα activity on migration and invasion of eR+ and eR− breast cancers is not clear. The aim of our study was to investigate the possible opposing effect of RhoGDIα on the migration and invasion of eR+ MCF7 and eR− MDA-MB-231 breast cancer cells. RhoGDIα was downregulated using short interfering RNA (siRNA) and upregulated using GFp-tagged ORF clone of RhoGDIα, and their ability for migration and invasion was assayed using transwell chambers. It was found that the silencing of RhoGDIα in MCF7 and MDA-MB-231 cells significantly increased migration and invasion of these cells into the lower surface of porous membrane of the chambers. Overexpression of RhoGDIα in MCF7 cells suppressed their migration and invasion, but no significant effect was found on MDA-MB-231 cells. Our results indicate that the downregulation of RhoGDIα similarly affects the in vitro migration and invasion of eR+ MCF7 and eR− MDA-MB-231 cells. however, our assays are differently affected by the upregulation of RhoGDIα in these two cell lines and this may be due to the differences in eR expression, primary invasive ability and/or other molecules between these two cell line models which warrant further investigation.

Keyword: Invasion; MCF7; MDA-MB-231; Migration; Transwell.